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RESEARCH BRIEF

Out-of-Pocket Spending for Influenza Hospitalizations in Medicare Advantage

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Introduction: Although many Medicare Advantage plans have waived cost sharing for COVID-19 hospitalizations, these waivers are voluntary and may be temporary. To estimate the magnitude of potential patient cost sharing if waivers are not implemented or are allowed to expire, this study assesses the level and predictors of out-of-pocket spending for influenza hospitalizations in 2018 among elderly Medicare Advantage patients.

Methods: Using the Optum De-Identified Clinformatics DataMart, investigators identified Medicare Advantage patients aged ≥65 years hospitalized for influenza in 2018. For each hospitalization, out-of-pocket spending was calculated by summing deductibles, coinsurance, and copays. The mean out-of-pocket spending and the proportion of hospitalizations with out-of-pocket spending exceeding $2,500 were calculated. A 1-part generalized linear model with a log link and Poisson variance function was fitted to model out-of-pocket spending as a function of patient demographic characteristics, plan type, and hospitalization characteristics. Coefficients were converted to absolute changes in out-of-pocket spending by calculating average marginal effects.

Results: Among 14,278 influenza hospitalizations, the mean out-of-pocket spending was $987 (SD=$799). Out-of-pocket spending exceeded $2,500 for 3.0% of hospitalizations. The factors associated with higher out-of-pocket spending included intensive care use, greater length of stay, and enrollment in a preferred provider organization plan (average marginal effect=$634, 95% CI=$631, $636) compared with enrollment in an HMO plan.

Conclusions: In this analysis of elderly Medicare Advantage patients, the mean out-of-pocket spending for influenza hospitalizations was almost $1,000. Federal policymakers should consider passing legislation mandating insurers to eliminate cost sharing for COVID-19 hospitalizations. Insurers with existing cost-sharing waivers should consider extending them indefinitely, and those without such waivers should consider implementing them immediately.

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INTRODUCTION

Although federal legislation mandates U.S. insurers to waive cost sharing for coronavirus disease 2019 (COVID-19) testing, no federal legislation imposes a similar mandate for COVID-19 hospitalizations.[1] A few states, such as Massachusetts, have mandated insurers to eliminate cost sharing for COVID-19 hospitalizations, but most states have not followed suit.[2] Several large insurers have waived cost sharing for COVID-19 hospitalizations among patients covered by their Medicare Advantage or private insurance plans, but it is unclear how long these waivers will be in place. For example, as of the time of writing, the insurer with the largest share of the Medicare Advantage

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market has only waived cost sharing for COVID-19 hospitalizations through January 31, 2021.[3,4]

Rather than relying on temporary and voluntary waivers by insurers, federal policymakers may wish to implement legislation mandating insurers to permanently waive cost sharing for COVID-19 hospitalizations. Although such mandates could particularly benefit elderly Medicare patients, a population that accounts for a disproportionate share of COVID-19 hospitalizations,[5] few studies have assessed this possibility. One study used information on inpatient benefit design to estimate the mean out-of-pocket spending for pneumonia hospitalizations among patients covered by traditional Medicare or Medicare Advantage.[6] However, this study only assessed projected out-of-pocket spending, which may differ from the actual out-of-pocket spending. For example, the study could not account for whether Medicare Advantage patients were required to make deductible payments or whether patients had met annual out-of-pocket maximums.

The primary objective of this study is to assess the magnitude of potential cost sharing for COVID-19 hospitalizations among Medicare Advantage patients if waivers by insurers are not implemented or are allowed to expire. The secondary objective is to identify the factors associated with higher levels of cost sharing for COVID-19 hospitalizations. To achieve these objectives, this study analyzes claims data from elderly Medicare Advantage patients hospitalized for influenza in 2018. Although COVID-19 is more lethal than influenza, influenza hospitalizations may be useful for estimating the potential financial burden of COVID-19 hospitalizations because the former also disproportionately affect the elderly and involve similar types of care.

METHODS

Data were derived from the 2018 Optum De-Identified Clinformatics DataMart. This national database includes 5.5 million Medicare Advantage patients enrolled at any point during 2018, representing one quarter of all Medicare Advantage patients in the U.S.[4] Because data were deidentified, the IRB of the University of Michigan Medical School exempted this study from review; informed consent was not required.

The sample included hospitalizations among Medicare Advantage patients aged ≥65 years that began in 2018 and had a primary or secondary diagnosis code for influenza (J09–J11). Hospitalizations were excluded if patients were still hospitalized when the claims run-off period ended or if patients had missing data for U.S. Census region.

Out-of-pocket spending was the sum of deductibles, coinsurance, and copays. The proportion of hospitalizations with out-of-pocket spending exceeding $2,500 or $4,000, levels representing approximately 2 and 4 SDs higher than the mean, was calculated. To identify the predictors of out-of-pocket spending, a 1-part generalized linear model with a log link and Poisson variance function was fitted; the variance function was chosen on the basis of the modified Park test.[7] Independent variables were patient demographic characteristics (age group, sex, Census region), the quarter during which hospitalizations began, plan type, intensive care use (on the basis of revenue codes), and length of stay. Quadratic and cubic terms for length of stay were included. To facilitate the interpretation of coefficients as absolute changes in out-of-pocket spending, average marginal effects (AMEs) were calculated.[8] Analyses used SAS, version 9.4, and Stata, version 15.1. Two-sided tests were performed; p-values <0.05 were considered significant.

RESULTS

Among 14,585 influenza hospitalizations included initially, 307 (2.1%) were excluded because patients were still hospitalized when the claims run-off period ended or had missing data for U.S. Census region, leaving 14,278 hospitalizations. Table 1 shows characteristics of the sample. Overall, 2,330 (16.3%) hospitalized patients were enrolled in HMO plans, 1,355 (9.5%) were enrolled in preferred provider organization plans, and 10,593 (74.2%)

Table 1. Characteristics of Influenza Hospitalizations Among Medicare Advantage Patients in 2018

Characteristics	Number (%)
Age group, years	
65–74	4,492 (31.5)
75–84	5,173 (36.2)
≥85	4,613 (32.3)
Sex	
Male	5,955 (41.7)
Female	8,323 (58.3)
U.S. Census region	
Northeast	2,652 (18.6)
Midwest	4,037 (28.3)
South	6,097 (42.7)
West	1,492 (10.5)
Quarter in which hospitalization began	
1 (January–March 2018)	12,175 (85.3)
2 (April–June 2018)	1,041 (7.3)
3 (July–September 2018)	188 (1.3)
4 (October–December 2018)	875 (6.1)
Any intensive care use[a]	
No	9,531 (66.8)
Yes	4,747 (33.3)
Plan type	
HMO	2,330 (16.3)
Preferred provider organization	1,355 (9.5)
Unspecified plan type[b]	10,593 (74.2)
Length of stay in days	
Mean (SD)	6.1 (6.5)
Median (25th–75th percentile)	4 (3–7)

[a]*Intensive care use* was defined as the occurrence of ≥1 claim with a revenue code for intensive care, 0200–0209.
[b]Additional detail is not provided in the database.

were enrolled in plans with an unspecified plan type. One third of the hospitalizations involved intensive care. The median length of stay was 4 days (25th–75th percentile=3–7 days).

The mean and median out-of-pocket spending were $987 (SD=$799) and $973 (25th–75th percentile=$275–$1,575), respectively. Out-of-pocket spending exceeded $2,500 and $4,000 for 423 (3.0%) and 49 (0.3%) hospitalizations, respectively. For 1,772 hospitalizations (12.4%), out-of-pocket spending was $0.

Table 2 shows the mean out-of-pocket spending by independent variable. The mean out-of-pocket spending varied moderately by patient age, sex, and Census region. Among 3,279 hospitalizations (22.9%) with a length of stay >7 days and 10,999 hospitalizations (77.0%) with a length of stay ≤7 days, the mean out-of-pocket spending was $1,252 ($984) and $908 ($717), respectively.

In adjusted analyses, the factors associated with higher out-of-pocket spending included intensive care use (AME=$63, 95% CI=$61, $64) and enrollment in a preferred provider organization plan compared with enrollment in an HMO plan (AME=$634, 95% CI=$631, $636). Length of stay was associated with higher out-of-pocket spending; the association was cubic (AME for linear term=$53.5, 95% CI=$53.3, $53.7; AME for quadratic term= −$1.043, 95% CI= −$1.049, −$1.038; AME for cubic term=$0.003834, 95% CI=$0.003809, $0.003859).

Table 2. Factors Associated With Out-of-Pocket Spending for Influenza Hospitalizations Among Medicare Advantage Patients in 2018

Factor	Mean out-of-pocket spending, $ (SD)	Average marginal effect, $(95% CI)[a]
Age group,[b] years		
65–74	1,065 (807)	ref
75–84	1,000 (790)	−56 (−57, −54)
≥85	896 (813)	−151 (−152, −149)
Sex		
Male	971 (790)	ref
Female	999 (806)	39 (38, 41)
U.S. Census region		
Northeast	1,082 (833)	ref
Midwest	905 (784)	−67 (−69, −66)
South	1,035 (805)	−34 (−36, −33)
West	846 (707)	−65 (−67, −63)
Quarter in which hospitalization began		
1 (January–March 2018)	1,013 (799)	ref
2 (April–June 2018)	866 (756)	−156 (−158, −155)
3 (July–September 2018)	821 (957)	−214 (−218, −210)
4 (October–December 2018)	807 (777)	−221 (−223, −219)
Any intensive care use		
No	928 (754)	ref
Yes	1,106 (871)	63 (61, 64)
Plan type		
HMO	832 (717)	ref
Preferred provider organization	1,528 (823)	634 (631, 636)
Other	952 (786)	108 (106, 109)
Length of stay in days		
Length of stay	N/A	53.5 (53.3, 53.7)
Length of stay squared	N/A	−1.043 (−1.049, −1.038)
Length of stay cubed	N/A	0.003834 (0.003809, 0.003859)

[a]For categorical variables, average marginal effects represent the absolute change in out-of-pocket spending if all patients were in the category in question versus if all patients were in the reference category, holding other covariates at their observed values. For continuous variables, average marginal effects represent the absolute change in out-of-pocket spending associated with a 1-unit increase in the variable, holding other covariates at their observed values.
[b]Age was top coded in the data set. Consequently, age could not be modeled as a continuous variable. The age categories 65–74 years, 75–84 years, and ≥85 years were chosen because they roughly split the sample into thirds.
N/A, not applicable

DISCUSSION

In this analysis of influenza hospitalizations among elderly Medicare Advantage patients, the mean out-of-pocket spending was almost $1,000. For 3 in 100 hospitalizations, out-of-pocket spending exceeded $2,500. In adjusted analyses, out-of-pocket spending was moderately associated with patient demographic characteristics and intensive care use and increased with the length of stay.

To date, studies assessing potential cost sharing for COVID-19 hospitalizations have mostly focused on nonelderly, privately insured patients.[9,10] For example, in 1 study of such patients, the mean out-of-pocket spending for respiratory infection hospitalizations between 2016 and 2019 was $1,961. The current analysis suggests that results from studies of privately insured patients overestimate potential cost sharing for COVID-19 hospitalizations among elderly Medicare Advantage patients, potentially owing to differences in insurance benefit design (e.g., the high prevalence of high-deductible health plans among the privately insured).

Despite the lower out-of-pocket spending for Medicare Advantage patients, the level of this spending was still substantial. In 2018, 40% of Americans lacked the savings to pay for a $400 emergency,[11] but the mean out-of-pocket spending for influenza hospitalizations in this study was 2.5 times higher than this amount. Thus, the finding that cost sharing for Medicare Advantage patients is comparatively low should not dissuade efforts to eliminate cost sharing for COVID-19 hospitalizations in this population.

Limitations

This study has limitations. First, the database did not include patients covered by traditional Medicare. Second, the median length of stay was lower than that of COVID-19 hospitalizations in published studies.[12] Because greater length of stay is associated with a higher out-of-pocket spending, findings may underestimate the magntiude of cost sharing for COVID-19 hospitalizations. Third, the database lacked information on whether patients were dually eligible for Medicaid. Fourth, information on plan type was unavailable for many patients. Finally, the generalizability of findings to all Medicare Advantage patients is unknown. Notably, however, the database includes approximately one quarter of all such patients in the U.S.

CONCLUSIONS

The potential for high cost sharing might dissuade some patients from seeking inpatient COVID-19 care, resulting in delays that could worsen outcomes. To prevent this, federal policymakers should consider implementing legislation that eliminates cost sharing for COVID-19 hospitalizations through the duration of the pandemic. In the interim, insurers with existing cost-sharing waivers should consider extending them indefinitely, and those without such waivers should consider implementing them immediately.

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REFERENCES

1. Chua K, Conti RM. *Despite the Families First Coronavirus Response Act, COVID-19 evaluation is not necessarily free*. HealthAffairs; 2020. April 17 https://www.healthaffairs.org/do/10.1377/hblog20200413.783118/full. Accessed May 25, 2020.
2. Insurance FAQs during COVID-19 (coronavirus) public health crisis. Mass.gov. https://www.mass.gov/info-details/insurance-faqs-during-covid-19-coronavirus-public-health-crisis#questions-about-coverage-for-treatment-of-covid-19-(coronavirus). Accessed July 8, 2020.
3. Our response to COVID-19. United Healthcare. https://www.uhc.com/health-and-wellness/health-topics/covid-19/our-response; https://www.uhc.com/health-and-wellness/health-topics/covid-19/coverage-and-resources. Accessed January 18, 2021.
4. Jacobson G, Freed M, Damico A, Neuman T. *A dozen facts about Medicare Advantage in 2019*. San Francisco, CA: Kaiser Family Foundation; 2019. https://www.kff.org/medicare/issue-brief/a-dozen-facts-about-medicare-advantage-in-2019. Published 2019. Accessed July 8, 2020.
5. Stokes EK, Zambrano LD, Anderson KN, et al. Coronavirus Disease 2019 case surveillance - United States, January 22-May 30, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(24):759–765. https://doi.org/10.15585/mmwr.mm6924e2.
6. Neuman T, Damico A, Cubanski J. *How much could Medicare beneficiaries pay for a hospital stay related to COVID-19?* San Francisco, CA: Kaiser Family Foundation; 2020. https://www.kff.org/coronavirus-covid-19/issue-brief/how-much-could-medicare-beneficiaries-pay-for-a-hospital-stay-related-to-covid-19/ . Published 2020. Accessed September 8, 2020.
7. Buntin MB, Zaslavsky AM. Too much ado about two-part models and transformation? Comparing methods of modeling Medicare expenditures. *J Health Econ*. 2004;23(3):525–542. https://doi.org/10.1016/j.jhealeco.2003.10.005.
8. Norton EC, Dowd BE, Maciejewski ML. Marginal effects-quantifying the effect of changes in risk factors in logistic regression models. *JAMA*. 2019;321(13):1304–1305. https://doi.org/10.1001/jama.2019.1954.
9. Rae M, Claxton G, Kurani N, McDermott D, Cox C. *Potential costs of COVID-19 treatment for people with employer coverage*. San Francisco, CA: Peterson-KFF Health System Tracker; 2020. https://www.healthsystemtracker.org/brief/potential-costs-of-coronavirus-treatment-for-people-with-employer-coverage/. Published 2020. Accessed March 17, 2020.

10. Eisenberg MD, Barry CL, Schilling CL, Kennedy-Hendricks A. Financial risk for COVID-19-like respiratory hospitalizations in consumer-directed health plans. *Am J Prev Med.* 2020;59(3):445–448. https://doi.org/10.1016/j.amepre.2020.05.008.
11. Board of Governors of the Federal Reserve System. Report on the economic well-being of U.S. Households in 2018. Washington, DC: Board of Governors of the Federal Reserve System; 2019. https://www.federalreserve.gov/publications/files/2018-report-economic-well-being-us-households-201905.pdf. Published 2019. Accessed May 20, 2020.
12. Lewnard JA, Liu VX, Jackson ML, et al. Incidence, clinical outcomes, and transmission dynamics of severe coronavirus disease 2019 in California and Washington: prospective cohort study [published correction appears in *BMJ.* 2020;369:m2205]. *BMJ.* 2020;369:m1923. https://doi.org/10.1136/bmj.m1923.